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REVIEW PAPER

Do Gamified Financial Literacy Tools Drive Insurance Uptake among MSMEs? Evidence from a Systematic Review toward a Sustainable Model

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Abstract

Purpose: This study systematically reviews the influences of gamification on financial literacy and insurance adoption among micro-, small-, and medium-sized enterprises (MSMEs), and develops a framework explaining how gamified interventions drive sustained insurance uptake.

Methodology: A search of Scopus and Google Scholar identified 1,134 records. After removing duplicates and screening 887 articles using the PRISMA framework, 32 studies were retained for analysis. These were synthesised to examine behavioural intention, underlying mechanisms, comparative effectiveness, and contextual moderators.

Results: Gamification elements such as simulations, challenges, rewards, feedback, and storytelling enhance engagement and learning. Their effects operate through three pathways: cognitive (improving understanding and risk awareness), motivational (boosting self-efficacy and sustained engagement), and social (strengthening trust and peer influence). Evidence shows gamified approaches outperform traditional financial education in knowledge retention, behavioural intention, and insurance uptake. However, effectiveness varies depending on digital readiness, cultural norms, institutional trust, and regulatory support.

Novelty and contribution: The study proposes an integrated conceptual framework linking gamification to insurance adoption through mediating and moderating mechanisms. It advances theory by combining Cognitive Load Theory, Self-Determination Theory, and Social Influence Theory into a unified model, offering a foundation for future empirical research.

Practical and social implications: Findings highlight the need for context-specific, inclusive, and culturally aligned gamified financial education. Policymakers and stakeholders should promote collaboration across sectors to support innovation, enhance financial inclusion, and strengthen MSME resilience through scalable digital learning solutions.

Keywords: Gamification, Financial Literacy, Insurance Adoption, MSMEs, PRISMA, Financial Inclusion, Behavioural Engagement, Digital Learning.

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1 Introduction

Micro, Small, and Medium Enterprises (MSMEs) constitute the lifeblood of most national economies and are widely recognised as engines of employment creation, innovation, and sustainable development. According to Piper (2023), MSMEs account for more than 70% of global employment and over 50% of GDP in emerging economies. Their contributions extend beyond job creation; they promote economic diversification, industrial linkages, and inclusive growth by providing opportunities for low-income earners, women, and youth to participate in productive economic activity (Gade, 2018; Ricci & Santilli, 2024).

In developing countries, MSMEs also serve as vehicles for poverty alleviation and social stability. Yet, despite their economic significance, these enterprises remain extremely vulnerable to multiple forms of risk: market shocks, business interruption, theft, climate change, and health crises. The COVID-19 pandemic further exposed the fragility of small businesses and highlighted the urgent need for effective risk management mechanisms (Saturwa et al., 2021). However, limited access to finance, weak risk culture, and low insurance penetration continue to constrain MSME resilience.

Insurance plays a crucial role in strengthening business continuity by transferring risks away from the enterprise. It provides a financial safety net that allows businesses to recover quickly from unexpected disruptions and avoid liquidation. Empirical studies (Tang, 2025; Nkouaga, 2025) confirm that insurance adoption enhances MSME sustainability by improving creditworthiness, increasing investment confidence, and facilitating recovery after shocks. Despite these benefits, the uptake of insurance among MSMEs remains persistently low globally.

Several structural and behavioural barriers explain this low adoption rate. These include limited awareness, low trust in insurance providers, inadequate product design, high premium costs, and cultural perceptions of insurance as unnecessary or unaffordable. The lack of tailored insurance products for small businesses and inadequate distribution channels further deepens this challenge. However, one of the most prominent barriers repeatedly identified is low financial literacy (Nkouaga, 2025).

Financial literacy, the ability to understand and apply financial concepts to make informed decisions, is increasingly recognised as a fundamental enabler of financial inclusion and resilience. For MSMEs, it influences the capacity to budget, manage credit, evaluate risk, and choose appropriate financial products (Yaacob et al., 2024). Evidence shows that entrepreneurs with higher financial literacy are significantly more likely to purchase insurance, save regularly, and adopt formal risk-mitigation instruments (Tang, 2025).

However, MSME owners often have a limited understanding of insurance products, policy terms, and claims processes. A study on micro-enterprises in Italy found that improved financial literacy increased the probability of purchasing business-interruption insurance (Nkouaga, 2025). Similarly, Khatri (2019) suggests that entrepreneurs often perceive insurance as complex or irrelevant because they do not understand its potential to stabilise business operations.

Traditional financial education approaches, such as seminars, classroom workshops, and awareness campaigns, have been used to address this gap. While these initiatives improve theoretical knowledge, they often fail to translate into behavioural change. Numerous entrepreneurs remain reluctant to act on newly acquired information, given motivational barriers, cognitive biases, and entrenched habits (Saturwa et al., 2021).

In recent years, digital technology has reshaped how financial education is delivered. The integration of gamification, the use of game elements like points, badges, leaderboards, simulations, storytelling, and rewards, into educational and financial platforms has acquired prominence. Gamification aims to make learning more interactive, enjoyable, and motivating by appealing to users' intrinsic and extrinsic motivations (Bayuk & Altobello, 2019).

Studies in educational psychology show that gamification improves engagement, information retention, and learning outcomes compared to traditional methods. In financial education, it has been used to teach budgeting, saving, and investment concepts effectively. For example, Bayuk and Altobello (2019) found that students who played finance-based board games demonstrated significant improvements in financial knowledge and decision-making confidence.

Beyond education, gamification has been applied in FinTech applications to nudge users toward positive financial behaviours, such as saving, investing, or repaying loans. These tools utilise behavioural economics principles, particularly the concepts of bounded rationality, heuristics, and nudges, to encourage action through interactive experiences. Yet, despite its potential, there is still a limited understanding of how gamified interventions influence insurance uptake behaviour, especially among MSMEs.

However, while gamification has shown promise in improving general financial literacy, its specific impact on insurance-related decision-making within the MSME context is underexplored. There is a scarcity of empirical studies that link gamified learning interventions to changes in insurance literacy, behavioural intentions, or actual uptake. Moreover, contextual factors such as digital access, cultural norms, and institutional infrastructure may moderate the effectiveness of gamified tools across different regions.

This knowledge gap underscores the need for a systematic review to consolidate existing evidence, identify theoretical and empirical patterns, and explain how gamified financial literacy tools can drive insurance participation among MSMEs globally. This study systematically reviews peer-reviewed literature to address the overarching questions:

i. How do gamified financial literacy tools influence the behavioural intentions of MSME owners toward adopting insurance products?

ii. What mechanisms link gamification features (e.g., rewards, simulations, interactive challenges) to improved insurance literacy and uptake among MSMEs?

iii. To what extent do gamified financial literacy interventions outperform traditional financial education methods in driving sustainable insurance adoption?

iv. What contextual factors (e.g., digital access, cultural norms, financial infrastructure) moderate the effectiveness of gamified financial literacy tools in insurance uptake among MSMEs globally?

2 Methodology

2.1 Research Design and Databases

To ensure a comprehensive and methodologically sound review of existing evidence on gamified financial literacy tools and insurance uptake among MSMEs, this study employed a systematic literature review (SLR) approach grounded in established academic protocols. The review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework, which provides transparent and standardised guideline for identifying, screening, and synthesising relevant studies (Page et al., 2021). The SLR design was chosen because it facilitates the systematic integration of diverse empirical and theoretical studies, allowing for the identification of patterns, mechanisms, and contextual factors that explain how gamification supports insurance adoption and financial inclusion among MSMEs (Bamiro et al., 2023; Salisu et al., 2024). Given the study's interdisciplinary nature, spanning financial education, insurance behaviour, gamification, and MSME development, the Scopus database was selected as the primary data source, given its extensive coverage of peer-reviewed literature. Scopus indexes over 70 million records and more than 21,600 journals from over 4,000 publishers worldwide, providing a rich and reliable base for academic inquiry (Bamiro et al., 2023).

To enhance comprehensiveness and reduce the likelihood of omitting relevant studies, additional searches were conducted on Google Scholar. The inclusion of this database ensured the capture of interdisciplinary studies published in the fields of finance, behavioural economics, fintech innovation, and digital education.

The search and selection process followed the four-phase PRISMA flow: identification, screening, eligibility, and inclusion, supported by the 27-item PRISMA checklist. This process enhanced the rigour and transparency of study selection, ensuring that only relevant, high-quality empirical works were included in the final synthesis.

2.2 Identification Phase

The literature search was designed to be systematic, replicable, and comprehensive in scope. To identify relevant studies examining the relationship between gamified financial literacy tools and insurance uptake among MSMEs, a multi-stage search strategy was implemented across the selected databases. The search covered the period from 2015 to 2025, reflecting a time when gamification acquired significant attention as an innovative approach in financial education and behavioural finance (Hamari et al., 2014). The search strategy combined both controlled vocabulary terms and free-text keywords to capture variations in terminology across disciplines.

Boolean operators ("AND," "OR"), truncation (*), and quotation marks (" ") were used to construct precise search strings that captured the intersection between gamification, financial literacy, insurance behaviour, and MSMEs. Example search queries used in Scopus and Google Scholar included:

("gamification" OR "game-based learning" OR "interactive learning tools" OR "digital game elements") AND ("financial literacy" OR "financial education" OR "financial capability") AND ("insurance" OR "risk management" OR "microinsurance" OR "insurance adoption") AND ("MSMEs" OR "small business" OR "entrepreneur*" OR "microenterprise")

Search results were filtered to include only peer-reviewed journal articles, conference papers, and theses published in English. The initial search results were exported into Microsoft Excel for deduplication and preliminary screening.

To ensure comprehensiveness, backward and forward citation tracking was also conducted on key studies identified in the initial phase. This process involved reviewing the reference lists and checking more recent publications that cited them. This multi-layered strategy ensured that both direct and indirect evidence related to gamified interventions and insurance behaviour among MSMEs were captured for synthesis.

2.3 Inclusion and Exclusion Criteria

To ensure methodological transparency and the inclusion of only high-quality studies, a set of inclusion and exclusion criteria was carefully established before the screening process. These criteria were grounded in the PRISMA 2020 guidelines (Page et al., 2021) and applied consistently across all stages of the review, including title, abstract, and full-text assessment.

Only peer-reviewed journal articles were considered for inclusion to maintain academic rigour and reliability. Studies were required to be published in English between 2015 and 2025, reflecting the period during which gamification and digital financial literacy tools began to gain prominence in financial education and insurance-related research. Each study was also expected to address explicitly at least one of the four research questions formulated for this review.

Conversely, studies that did not meet these criteria were excluded. Non-English publications were removed due to language and translation limitations that could compromise interpretative accuracy. Likewise, articles published outside the selected period (before 2015 or after 2025) were excluded to ensure temporal relevance to contemporary gamification practices. Book chapters, theses, dissertations, and conference papers were also omitted since they often lack the peer-review rigour characteristic of journal articles. Additionally, studies unrelated to the central research questions were excluded from the final analysis.

Applying these inclusion and exclusion criteria ensured that only the most relevant and methodologically sound studies were retained. Out of an initial 1,134 records identified through database searches, 94 articles were subjected to full-text review. Following the application of the inclusion parameters, 32 peer-reviewed studies met all eligibility conditions and were incorporated into the final synthesis for analysis and discussion.

2.4 Study Selection Process

The study selection process followed the PRISMA 2020 framework to ensure methodological transparency and reproducibility (Page et al., 2021). After the search strategy was executed across the Scopus and Google Scholar databases, all retrieved records were exported and consolidated into Microsoft Excel to facilitate systematic management and screening. This merging process enabled the elimination of duplicate entries and the careful organisation of studies according to the review's inclusion and exclusion criteria.

An initial total of 1,134 records were identified from the database searches using multiple search strings designed to capture studies on gamified financial literacy, MSMEs, and insurance adoption. Upon merging all search results in Excel, a duplicate check revealed 247 redundant records, which were subsequently removed. The remaining studies were then subjected to a title and abstract screening to determine their topical relevance. At this stage, 793 studies were excluded for not aligning with the review's focus on gamified financial literacy and insurance-related outcomes.

Ninety-four potentially relevant articles proceeded to the full-text screening phase. During this stage, each article was evaluated to confirm its alignment with the research questions, inclusion criteria, and methodological relevance.

Studies that did not focus on MSMEs, gamified financial literacy, or insurance adoption were excluded. After this rigorous process, 32 peer-reviewed studies met all eligibility conditions and were retained for the final synthesis.

This systematic selection process ensured a transparent and replicable pathway from identification to inclusion. The review's adherence to PRISMA guidelines enhanced the validity and reliability of the findings by minimising bias and ensuring that only methodologically sound and contextually relevant studies were incorporated into the analysis. A PRISMA flow summary illustrating this process is presented in Figure 1.

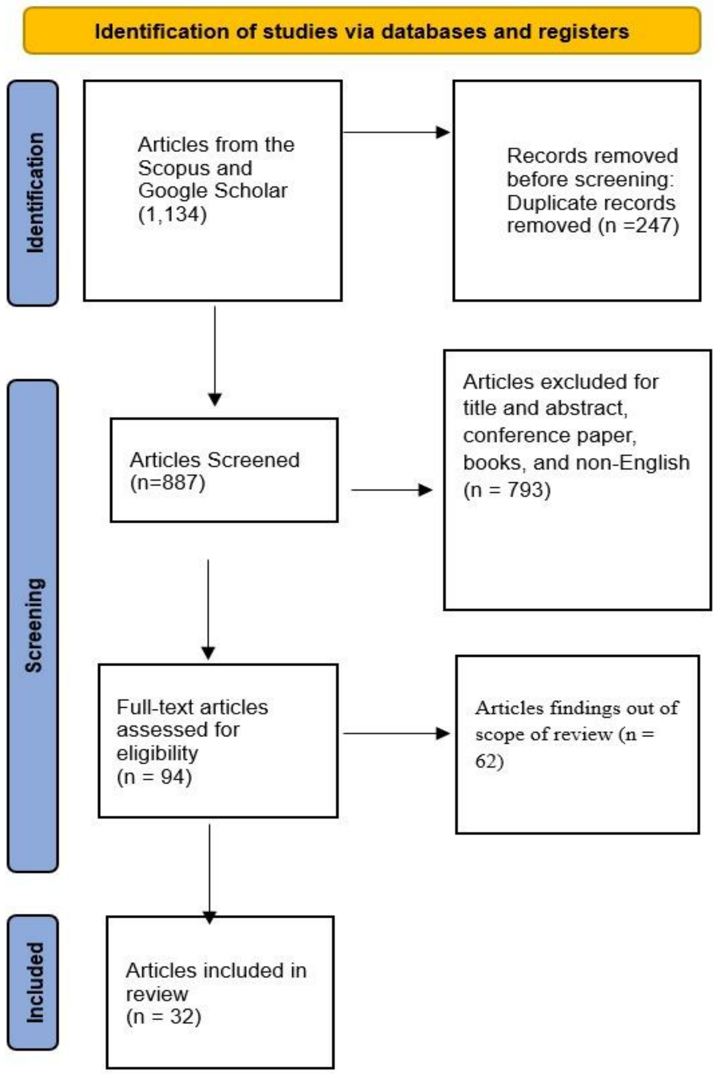

Figure 1 PRISMA flow diagram

3 Data Extraction

To expedite and systematise the evaluation process, data extraction was conducted for all 32 studies that fully met the inclusion criteria, as seen in Table 1. The extraction process was designed to capture comprehensive and comparable information across studies, ensuring the consistency and reliability of the review outcomes. A structured data extraction sheet was developed to record key study characteristics and thematic insights relevant to the research objectives.

For each included study, essential bibliographic and contextual details were retrieved, including the author's name, year of publication, research country or regional context, methodological design, and industry or sector focus.

Information on the journal of publication was also recorded to verify the scholarly quality and disciplinary relevance of each article. This systematic extraction ensured a comprehensive and analytically rich evidence base, enabling cross-comparison and synthesis across diverse methodological approaches and geographical contexts. The extracted data provided the foundation for the subsequent analysis and synthesis of findings.

Table 1 Data Extraction

S/N	Author's Name & Year	Methodology	Country	Sector	Journal
1	Gupta and Jaiswal (2025)	Mixed Method	USA	Insurance	Information Discovery and Delivery
2	Zhang et al. (2024)	Mixed Method	Malaysia	Financial services sector	International Journal of eBusiness and eGovernment Studies
3	Haamukwanza (2021)	Qualitative	Zambia	Insurance	SN Business & Economics
4	Miller et al. (2019)	Mixed Method	UAE	Financial services sector	International Journal of Innovation, Creativity and Change
5	Delemere and Liston (2024)	Quantitative	Ireland	Energy	Energy Reports
6	Lisana et al. (2025)	Quantitative	Indonesia	Financial services sector	Entertainment Computing
7	Rubin et al. (2025)	Quantitative	China	Insurance	Journal of Chinese Agricultural Mechanisation
8	Lei and Wang (2025)	Quantitative	China	Insurance and Finance	International Review of Financial Analysis
9	Hunjra et al. (2016)	Quantitative	India	Financial services sector	Journal of Contemporary Management Sciences
10	Adam et al. (2025)	Mixed Method	Indonesia	Insurance and Finance	Journal of Southeast Asian Economies
11	Agrawal (2025)	Quantitative	India	Insurance and Finance	International Journal of Accounting and Economics Studies
12	Nainggolan et al. (2025)	Qualitative	Indonesia	MSME / Digital Financial Literacy / FinTech Adoption	Journal of Lifestyle and SDGs Review
13	Yaacob et al. (2024)	Quantitative	Malaysia	Financial services sector	Jurnal Pengurusan
14	Zhao and Fang (2023)	Qualitative	USA	Financial services sector	Journal of Information Technology Education. Research
15	Permatasari et al. (2025)	Quantitative	India	Insurance and Finance	Journal of Applied Data Sciences
16	Saputra et al. (2021)	Qualitative	Indonesia	Multiple sectors	Journal of Economics and Business
17	Saputra and	Qualitative	Indonesia	Not Stated	Journal of Accounting and

	Rahmatia (2021)				Strategic Finance
18	Aries et al. (2020)	Quantitative	Indonesia	Not stated	Management Science Letters
19	Sari et al. (2025)	Quantitative	Indonesia	Multiple sectors	Journal Entrepreneur dan Entrepreneurship
20	Pradana et al. (2023)	Quantitative	Indonesia	Multiple sectors	International Journal of Interactive Mobile Technologies
21	Chakraborty and Kr Das (2019)	Qualitative	India	MSMEs Sector	Journal of International Business, Economics and Entrepreneurship
22	Setijawan et al. (2023)	Mixed Method	Indonesia	Insurance and MSMEs	The International Journal of Financial Systems
23	Mayangsari et al. (2024)	Qualitative	Indonesia	Insurance and MSMEs	Research Horizon
24	Lesar and Iriani (2024)	Qualitative	Indonesia	Insurance and MSMEs	Journal of Economics, Business, and Government Challenges
25	Prasad (2021)	Qualitative	India	Insurance and MSMEs	Journal of Business Strategy, Finance and Management
26	Li and Liu (2025)	Qualitative	China	Insurance and MSMEs	International Review of Financial Analysis
27	Lestari et al. (2025)	Quantitative	Indonesia	MSMEs	The Journal of Behavioural Science
28	Fahlevi et al. (2025)	Quantitative	Switzerland	Agricultural MSMEs	Agriculture
29	Rizkiana and Khalisabira (2023)	Qualitative	Indonesia	Multiple sectors	Community Service Journal
30	Gunasegari (2025)	Qualitative	India	Industrial	The Review of Diabetic Studies
31	Tereszkiewicz and Cichowicz (2024)	Qualitative	USA	Multiple sectors	Computer Law & Security Review
32	Mendoza (2023)	Qualitative	USA	Insurance	Health Promotion International

3.1 Methodology Analysis

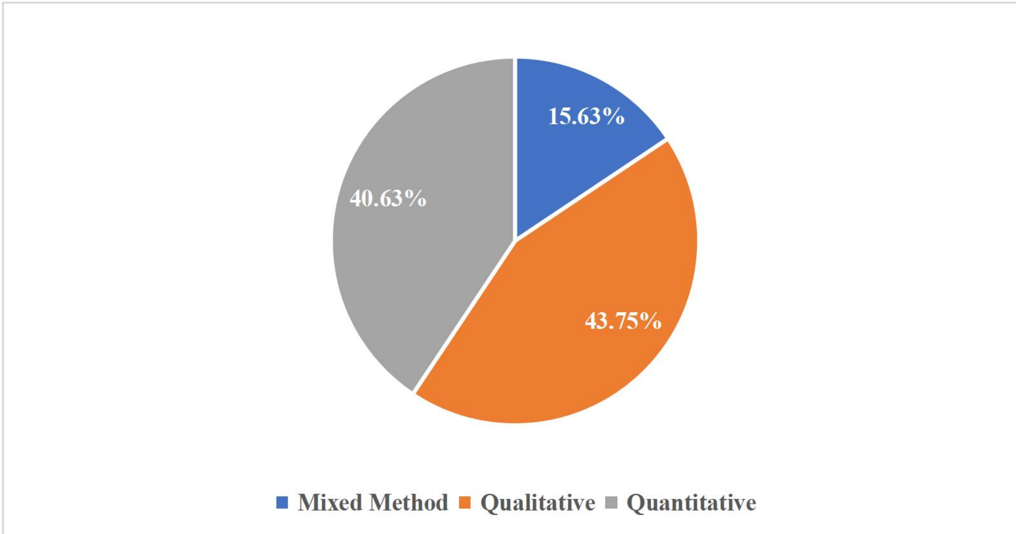

Figure 2 Methodology Analysis

As seen in Figure 2, the methodological approaches adopted across the 32 studies varied considerably, reflecting the interdisciplinary nature of research on gamified financial literacy and insurance uptake among MSMEs. The analysis of methodological designs revealed that qualitative methods were the most prevalent, accounting for 43% of the total studies (n = 14). Quantitative approaches followed closely, representing 41% of the reviewed articles (n = 13), while mixed-method designs constituted 16% (n = 5).

The predominance of qualitative studies suggests that researchers in this domain have largely focused on exploring contextual and behavioural dimensions of gamified financial literacy, particularly in understanding user experiences, perceptions, and motivational mechanisms influencing insurance adoption. Such studies often employed interviews, focus groups, or content analyses to capture nuanced insights into how MSME owners engage with gamified learning tools and how these tools shape financial decision-making behaviour.

Quantitative studies, on the other hand, primarily utilised survey and experimental designs to examine relationships between gamification features, financial literacy outcomes, and insurance uptake. These studies provided valuable empirical evidence on causal and correlational dynamics, offering measurable insights into the effectiveness of gamified interventions compared to traditional financial education methods.

Mixed-method studies combined both qualitative and quantitative elements to provide a more holistic understanding of the phenomenon. By integrating numerical data with qualitative interpretations, these studies validated behavioural patterns while simultaneously explaining the underlying mechanisms that drive insurance adoption through gamified tools.

Ultimately, the methodological diversity across the reviewed studies underscores the complexity of investigating the intersection between gamification, financial literacy, and insurance behaviour. It highlights the importance of multi-dimensional research designs that can capture both the measurable impacts and the experiential realities of MSME engagement with gamified financial education platforms.

3.2 Research Country Affiliation

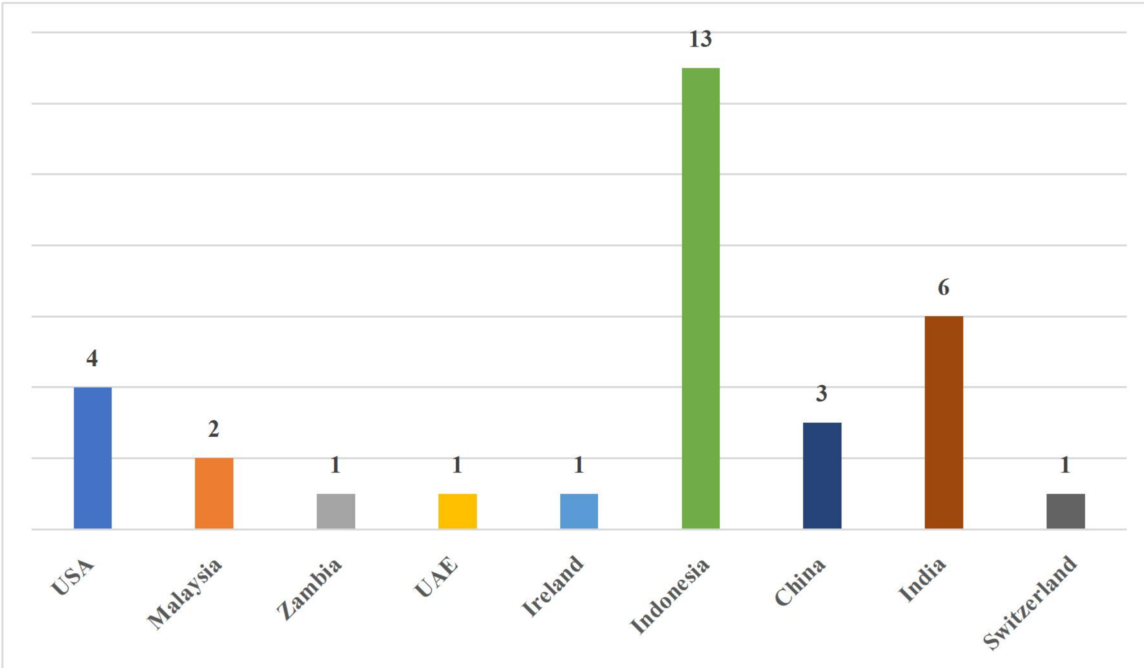

Figure 3 Research country analysis

The geographical distribution of the reviewed studies demonstrates a significant regional concentration, with notable variations in research activity across different countries. Among the 32 studies analysed, Indonesia accounted for the highest number, representing 41% of the total (n = 13). This dominance suggests strong research interest in gamified financial literacy and insurance-related studies in Southeast Asia, particularly in contexts where MSMEs constitutes a critical component of the national economy and where digital financial inclusion initiatives are rapidly evolving. India followed with six studies (19%), reflecting the country's growing focus on FinTech-driven financial literacy and digital insurance adoption among small business owners. The United States contributed four studies (13%), highlighting the continued academic interest in gamification as a behavioural and educational tool within mature financial systems. China accounted for three studies (9%), with research often emphasising technology-driven financial education interventions and the behavioural outcomes associated with gamified learning environments.

Other countries represented in the review included Malaysia (n = 2) and one study each from Zambia, the United Arab Emirates, Ireland, and Switzerland. The presence of studies from both developed and developing economies underscores the global relevance of gamified financial literacy research. However, the dominance of studies from Asia indicates that much of the empirical evidence on the relationship between gamification, financial literacy, and insurance adoption among MSMEs is emerging from rapidly digitising markets.

This distribution also reveals a noticeable research gap in regions such as Africa and Latin America, where MSMEs play a vital economic role but remain underrepresented in studies exploring gamified financial education. The limited number of investigations from these regions suggests an opportunity for future research to expand the geographical scope and enhance the generalisability of findings across diverse socio-economic and cultural contexts.

3.3 Research Publication Year

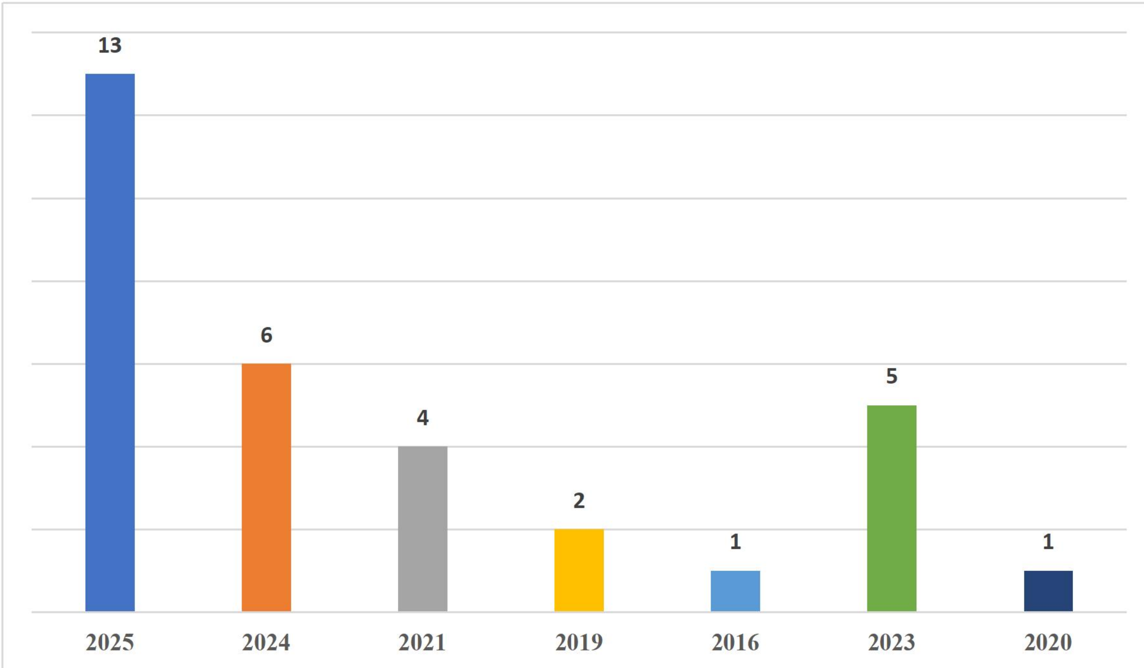

Figure 4 Article Publication Year

The temporal distribution of the reviewed studies reflects the growing scholarly attention to gamified financial literacy and its implications for insurance adoption among MSMEs over the past decade. As seen in Figure 4, most of the studies were published between 2020 and 2025, illustrating a recent surge in academic interest that coincides with the global expansion of digital finance, FinTech innovation, and gamification in educational contexts.

Specifically, 2025 recorded the highest number of publications, accounting for 13 studies, which represents the peak of research activity within the review period. This sharp increase underscores the contemporary relevance of gamified approaches in financial education and their potential to drive behavioural change in financial inclusion and insurance adoption. The year 2024 followed with six studies, while 2023 contributed five, collectively indicating that over 75% of the reviewed literature was published within the last three years.

Earlier studies were comparatively fewer, with four published in 2021, two in 2019, one in 2020, and one in 2016. The gradual rise from 2016 onward suggests that gamified financial literacy initially emerged as a niche topic but has rapidly evolved into a mainstream research area, especially as digital platforms increasingly integrate game-based learning techniques to enhance financial decision-making among entrepreneurs and MSME owners.

This upward trend demonstrates both the novelty and dynamism of the research field. It also implies that the academic discourse surrounding gamified financial literacy and insurance uptake remains in an early but fast-growing phase, offering ample opportunities for further empirical investigation, model development, and cross-country comparisons in the coming years.

4 Discussion of Result

4.1 How do gamified financial literacy tools influence the behavioural intentions of MSME owners toward adopting insurance products?

Across the reviewed studies, a coherent pattern emerges: gamified financial literacy interventions influence MSME owners' behavioural intentions toward insurance adoption primarily by increasing engagement and motivation, improving understanding of insurance concepts, reshaping risk perception, and lowering perceived complexity and psychological barriers to purchase. Multiple studies report that gamified elements, such as simulations, business games, rewards/feedback loops, competition, and narrative storytelling, operate together to convert passive awareness into actionable intent.

First, several studies demonstrate that gamification increases user engagement and motivation, which are key precursors to intentional behaviour. Experimental and quasi-experimental evidence from business-simulation interventions showed marked improvements in participants' engagement, strategic awareness, and willingness to act on financial decisions (Miller et al., 2019; Pradana et al., 2023). Studies of digital and game-based learning find consistent increases in motivation, satisfaction, and sustained use (Yaacob et al., 2024; Zhao & Fang, 2023; Permatasari et al., 2025). This heightened engagement appears to increase the likelihood that MSME owners will attend to, internalise, and act upon insurance-related content.

Second, by improving financial and insurance literacy, gamified tools strengthen the cognitive foundations of intention. Multiple studies show that game-based learning makes abstract insurance concepts tangible through interactive scenarios and "what-if" simulations, thereby enhancing comprehension of premiums, coverage, and claims processes (Zhang et al., 2024; Setijawan et al., 2023; Lesar & Iriani, 2024). This improved comprehension translates into greater confidence and more rational, cost-sensitive decision making (Delemere & Liston, 2024; Lei & Wang, 2025), which in turn increases behavioural intention to purchase insurance.

Third, gamified interventions appear to affect risk perception and the translation of perceived risk into protective action. Studies indicate that simulations and scenario-based gameplay help MSME owners recognise business-specific risks and the protective value of insurance, thereby increasing perceived utility and prompting risk-mitigating intentions (Rubin et al., 2025; Lei & Wang, 2025; Fahlevi et al., 2025). Where gamified content heightens perceived usefulness and demonstrates tangible protective outcomes, the intention to adopt insurance grows (Agrawal, 2025).

Fourth, gamification reduces information asymmetry and perceived complexity, making insurance products feel more accessible. Interactive, experiential learning reduces the cognitive load associated with insurance concepts and demystifies procedures, which lowers behavioural barriers and increases readiness to adopt formal financial protection (Setijawan et al., 2023; Saputra et al., 2021; Chakraborty & Kr Das, 2019). Storytelling and culturally sensitive narratives embedded in games also help correct misperceptions and reshape socio-cultural attitudes toward debt and risk (Adam et al., 2025), further supporting adoption intent.

Fifth, psychological mechanisms, such as increased self-efficacy, goal orientation, and future-oriented thinking, mediate the gamification-to-intention pathway. Studies report that gamified features that promote mastery, immediate feedback, and small wins enhance users' sense of competence and empowerment, which predicts greater behavioural intention (Aries et al., 2020; Prasad, 2021; Sari et al., 2025). These affective and motivational shifts complement cognitive gains, resulting in stronger intention signals.

Importantly, the evidence comes from a mix of methodological approaches. Qualitative studies supply rich processual accounts of user experience and perceived behavioural change (various studies from Indonesia, India, and elsewhere), while quantitative and experimental studies provide measurable relationships between gamified exposure and intention or literacy improvements (Miller et al., 2019; Zhang et al., 2024; Rubin et al., 2025). Across study designs, the convergence of findings strengthens confidence in the general conclusion that gamified financial literacy tools positively influence MSME insurance intentions. Nevertheless, heterogeneity in intervention design, outcome measurement, and sample contexts constrains the ability to estimate effect sizes or to claim universal effectiveness.

Collectively, the reviewed evidence indicates that gamified financial literacy tools influence MSME owners' behavioural intentions toward insurance adoption through mutually reinforcing pathways: enhanced engagement and sustained exposure; improved comprehension of insurance concepts; reframing of risk perception toward protective action; and reduced perceived complexity and cultural misgivings. These mechanisms operate via cognitive (knowledge), affective (motivation/self-efficacy), and contextual (access/trust) channels to increase willingness to consider and adopt insurance.

4.2 What mechanisms link gamification features (e.g., rewards, simulations, interactive challenges) to improved insurance literacy and uptake among MSMEs

The reviewed studies collectively support a multi-pathway model, wherein gamification features influence insurance literacy and uptake through the interaction of cognitive, affective, social, motivational, and contextual mechanisms.

Although individual studies emphasise different levers, together they construct a coherent explanation of how specific game elements, simulations, feedback loops, reward systems, narrative/storytelling, progress tracking, and social mechanics produce learning gains and behavioural change relevant to insurance adoption.

Cognitive mechanisms emerge prominently through interactive simulations and scenario-based gameplay. Several studies show that immersive, decision-rich simulations allow MSME owners to experience risk, test decisions, and observe outcomes in a low-stakes environment, which accelerates conceptual understanding and mental models of insurance (Miller et al., 2019; Delemere & Liston, 2024; Setijawan et al., 2023; Lesar & Iriani, 2024). These "what-if" scenarios concretise abstract insurance concepts — premiums, coverage limits, claim processes, and trade-offs — and thereby reduce information asymmetry. By making consequences observable, simulations help learners internalise the protective value of insurance and translate knowledge into perceived utility, a necessary cognitive precursor to uptake (Lei & Wang, 2025; Rubin et al., 2025).

Feedback, progress tracking, and reinforcement mechanisms further strengthen learning and motivational loops. Studies indicate that immediate, actionable feedback fosters reflective thinking and corrective learning; progress indicators and small-win mechanics build mastery and sustain engagement (Yaacob et al., 2024; Pradana et al., 2023; Hunjra et al., 2016). This continuous feedback refines decision-making heuristics and increases self-efficacy — the belief that one can competently evaluate and use insurance products (Aries et al., 2020; Prasad, 2021). Increased self-efficacy reduces perceived behavioural control barriers and elevates the likelihood of adoption.

Motivational mechanisms operate through the strategic use of extrinsic and intrinsic reward systems that convert short-term engagement into repeated exposure and deeper learning. Points, badges, and goal achievements stimulate immediate motivation, while well-designed challenges aligned with intrinsic goals (mastery, autonomy, purpose) sustain long-term engagement (Prasad, 2021; Yaacob et al., 2024). Empirical parallels show that incentives and subsidies can increase insurance uptake; in gamified contexts, carefully structured rewards emulate these incentives by increasing perceived value and reinforcing desired learning behaviours (Rubin et al., 2025; Agrawal, 2025).

Social and contextual mechanisms draw on peer influence and normative learning to shape attitudes towards insurance adoption. Leaderboards, collaborative tasks, and social sharing activate herd effects and peer learning, which can normalise insurance purchase as a prudent business practice (Hunjra et al., 2016; Zhao & Fang, 2023). Social features also provide a forum for observational learning and reputation-based signalling, which can mitigate mistrust and culturally rooted resistance to formal financial products (Adam et al., 2025).

Narrative and affective mechanisms further enhance engagement by embedding insurance benefits within culturally resonant, business-grounded, and emotionally meaningful contexts. Storytelling that contrasts insured and uninsured outcomes, or that embeds culturally relevant scenarios, reduces emotional resistance and reshapes attitudes toward debt and risk (Setijawan et al., 2023; Adam et al., 2025). This mechanism is particularly important in contexts where socio-cultural inhibitors and mistrust limit engagement with formal insurance.

Digital and practical literacy mechanisms play a bridging role in knowledge acquisition and behavioural execution. Several studies identify multidimensional literacy, financial knowledge, digital capability, and practical "know-how" as mediators that link gamified exposure to adoption (Nainggolan et al., 2025; Rizkiana & Khalisabira, 2023). Gamified systems that simultaneously build digital skills and financial procedures (e.g., calculating premiums, filing claims) reduce operational barriers and increase the probability that intention converts to purchase.

Implementation and design frameworks provide a structured lens for understanding how gamified interventions produce outcomes across stages of engagement. This framework typically spans problematisation (identifying gaps), design/build (creating the gamified environment), intervention (deployment with feedback and rewards), and evaluation (measuring outcomes). This staged pathway clarifies how engagement must be designed, reinforced, and assessed to produce the literacy and behavioural endpoints required for insurance uptake (Rizkiana & Khalisabira, 2023; Fahlevi et al., 2025).

Taken together, these mechanisms suggest that gamified interventions operate through interlocking cognitive, motivational, social, and contextual pathways. Their combined effect is most evident when simulations build understanding; feedback generates comprehension and risk awareness, increasing the perceived usefulness of insurance; rewards, progress, and mastery boost engagement, self-efficacy, and goal orientation, thereby raising behavioural readiness; social features and culturally framed narratives reduce mistrust and perceived complexity; and digital literacy removes operational barriers. When these chains operate together, gamified interventions are most likely to translate literacy gains into actual insurance uptake (Setijawan et al., 2023; Permatasari et al., 2025; Lesar & Iriani, 2024).

4.3 To what extent do gamified financial literacy interventions outperform traditional financial education methods in driving sustainable insurance adoption

The body of evidence in the reviewed studies consistently indicates that gamified financial literacy interventions outperform traditional, lecture-based, or brochure-style financial education on several proximal outcomes that are essential precursors to sustainable insurance adoption. Across experimental, quasi-experimental, and observational designs, gamified approaches produce larger gains in comprehension of insurance concepts, higher short-term retention, greater learner satisfaction, and stronger motivational and behavioural precursors (engagement, self-efficacy, goal orientation) than conventional methods.

Empirical comparisons consistently demonstrate superior learning outcomes among gamified learners. Multiple studies report significant pre-to-post improvements for gamified cohorts on measures of knowledge, application capacity, and task completion versus traditional cohorts (Yaacob et al., 2024; Zhao & Fang, 2023; Pradana et al., 2023). These gains reflect the well-documented affordances of gamification — active learning through simulation, immediate feedback, and reward structures that convert passive information delivery into experiential understanding. Several papers go further, reporting higher completion and persistence rates for gamified modules, a crucial advantage where sustained engagement is necessary for durable behaviour change (Permatasari et al., 2025; Saputra & Rahmatia, 2021; Rizkiana & Khalisabira, 2023).

The mechanisms that explain gamification’s superiority over traditional methods are consistent across studies. Gamified interventions reduce cognitive load by concretising abstract insurance concepts through interactive scenarios and “what-if” simulations, thereby enhancing comprehension and decision-making heuristics (Setijawan et al., 2023; Lesar & Iriani, 2024). They also address affective and motivational barriers: reward systems and visible progress strengthen intrinsic and extrinsic motivation, while social elements and culturally framed narratives reduce mistrust and normalise insurance as a prudent business practice (Aries et al., 2020; Adam et al., 2025; Hunjra et al., 2016). Taken together, these effects boost the proximate determinants of adoption — knowledge, confidence, perceived usefulness, and readiness to act, more strongly than lecture-style workshops or passive awareness campaigns (Chakraborty & Kr Das, 2019; Fahlevi et al., 2025).

Evidence cited in the review also suggests that gamified approaches have greater potential to produce sustained behavioural change because they cultivate capabilities (financial and digital) rather than only raising transient awareness. Studies emphasise that gamification builds practical know-how — for example, calculating premiums, filing claims, and navigating digital purchase channels — thereby bridging the gap between intention and purchase (Fahlevi et al., 2025; Nainggolan et al., 2025). While traditional education raises awareness but leaves capability unchanged, gamified modules are more likely to create the operational competence necessary for sustained adoption.

However, several caveats temper a categorical claim of gamification’s superiority in producing sustained insurance uptake. First, numerous evaluations focus on proximal outcomes (knowledge, intention, short-term retention) rather than long-term observed purchase behaviour; fewer studies track real insurance purchases and renewals over extended periods. Second, intervention durations are often short, and follow-up windows are limited, which constrains inference about durability. Third, heterogeneity in the design and fidelity of gamified interventions makes it difficult to generalise which specific elements (e.g., simulation fidelity, reward magnitude, social features) are necessary or sufficient for outperforming traditional methods across contexts. Fourth, contextual factors such as digital access, product availability, trust in insurers, and affordability remain decisive in converting improved literacy into sustained uptake; gamification alone cannot substitute for these market and institutional enablers (Setijawan et al., 2023; Agrawal, 2025).

In summary, the reviewed literature provides robust evidence that gamified financial literacy interventions outperform traditional financial education on intermediate outcomes that predict insurance adoption, comprehension, engagement, retention, and behavioural readiness. The available studies support the contention that gamification is a more effective learning modality for eliciting the psychological and practical changes necessary for adoption. Nevertheless, claiming that gamified interventions universally produce superior sustained insurance uptake requires caution. Long-term field studies that measure actual purchase and renewal behaviour and that control for market/contextual variables are still limited.

4.4 What contextual factors (e.g., digital access, cultural norms, financial infrastructure) moderate the effectiveness of gamified financial literacy tools in insurance uptake among MSMEs globally?

The reviewed evidence indicates that the effectiveness of gamified financial-literacy interventions for driving insurance uptake among MSMEs is strongly conditional on a set of contextual moderators that operate at the individual, technological, institutional, and socio-cultural levels. These moderators do not simply amplify or dampen gamification's instructional power; they shape whether increased literacy and intention can realistically convert into insurance purchase and sustained use.

Digital access and digital literacy emerge repeatedly as primary moderators. Studies show that platform familiarity, basic technical skills, and reliable internet or mobile connectivity are prerequisites for meaningful interaction with gamified modules (Aries et al., 2020; Zhao & Fang, 2023; Permatasari et al., 2025). Where digital readiness is high, gamified tools improve engagement, comprehension, and follow-through. Conversely, limited connectivity or low digital skills impede exposure, reduce the fidelity of the learning experience, and weaken the pathway from learning to adoption (Agrawal, 2025; Saputra et al., 2021).

Institutional factors and service environment are decisive moderators. Research highlights the importance of service quality, regulatory clarity, and insurer reliability in mediating whether literacy gains produce uptake (Haamukwanza, 2021; Lesar & Iriani, 2024). Studies also stress that trust and transparency in providers, and broader trust in digital systems and financial institutions, are central mediators linking increased awareness to behavioural intention (Gupta & Jaiswal, 2025; Gunasegari, 2025). In low-trust contexts, even highly engaging gamified programs struggle to convert intentions into purchases unless accompanied by credible institutional guarantees or third-party endorsements.

Financial capacity and affordability are practical boundary conditions. Several studies report that MSMEs' income, liquidity, and access to credit moderate uptake: gamified literacy increases willingness to purchase, but affordability constraints or mismatched product design block actual adoption (Gupta & Jaiswal, 2025; Setijawan et al., 2023). This suggests that gamification must be paired with product design, pricing strategies, or subsidy mechanisms to realise real uptake among constrained MSMEs (Rubin et al., 2025).

Cultural and religious norms significantly shape receptivity and behavioural change. Evidence from collectivist and religiously conservative settings shows that social influence, moral beliefs about debt, and culturally rooted risk attitudes can either enable or inhibit the effectiveness of gamified interventions (Hunjra et al., 2016; Adam et al., 2025; Lestari et al., 2025). Studies recommend localisation of narrative, inclusion of culturally appropriate scenario design (for example, Sharia-compliant framing), and engagement with trusted community leaders to align gamified content with local norms (Permatasari et al., 2025; Setijawan et al., 2023).

Regulatory environment and public policy act as higher-order moderators. Clear regulatory safeguards and supportive public policies (e.g., incentives, subsidies, rural outreach) increase the probability that improved literacy will lead to uptake (Haamukwanza, 2021; Mendoza, 2023). Where regulation is weak, the perceived post-purchase risks (claims rejection, fraud) blunt the effect of any literacy intervention, gamified or otherwise (Tereszkiewicz & Cichowicz, 2024).

Organisational and MSME characteristics are also significant determinant. Heterogeneity in managerial capacity, sectoral risk profiles, age of owner, and prior exposure to digital tools moderate outcomes. Younger, digital-native entrepreneurs and firms with stronger managerial capacity tend to derive greater benefit from gamified modules (Saputra & Rahmatia, 2021; Chakraborty & Kr Das, 2019; Li & Liu, 2025). Gender and geography (urban vs rural) further moderate willingness and ability to adopt insurance, often interacting with access and affordability constraints (Gupta & Jaiswal, 2025).

Economic conditions and timing further moderate outcomes. Periods of economic uncertainty can both increase the salience of insurance (raising receptivity) and reduce purchasing power (lowering ability), making the net effect context dependent (Saputra et al., 2021). Where gamified training was delivered during crisis periods, it sometimes had greater relative value for maintaining engagement and trust, but conversion to purchase still depended on broader economic supports.

Finally, product relevance and usability moderate translation from literacy into uptake. Gamified modules that mirror locally relevant products, clarify premiums and claims processes, and teach operational 'how-to' steps (e.g., purchasing online, filing claims) reduce transactional friction and increase conversion rates (Nainggolan et al., 2025; Fahlevi et al., 2025). Without product-market fit, literacy gains risk remaining hypothetical intentions.

4.5 Conceptual Framework

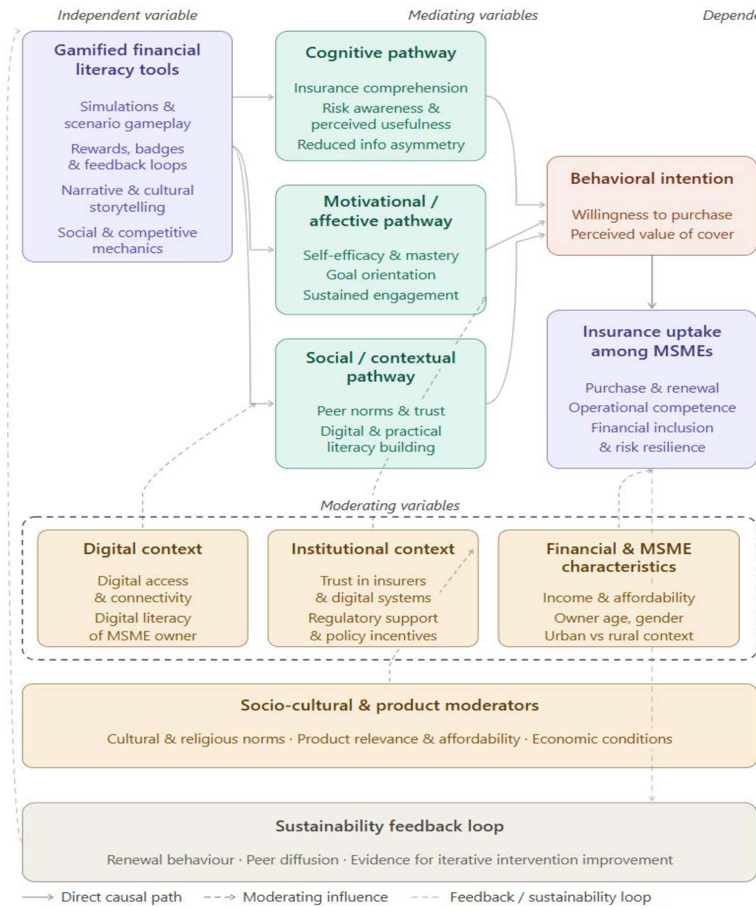

Figure 2 Conceptual Framework

Framework explanation

Overview

The framework models a multi-pathway process in which gamified financial literacy tools drive sustainable insurance uptake among MSMEs through multiple parallel mediating chains, cognitive, motivational/affective, and social/contextual, whose effectiveness is shaped by key contextual moderators. A feedback loop at the base represents the sustainability dimension: adoption behaviours generate evidence and peer diffusion that feeds iteratively back into intervention design.

Independent variable: Gamified financial literacy tools

The model's left column captures four core gamification elements identified across the reviewed studies. Interactive simulations and scenario-based gameplay are positioned as the primary cognitive lever, enabling MSME owners to observe risk consequences in safe environments (Miller et al., 2019; Setijawan et al., 2023; Lesar & Iriani, 2024). Rewards, badges, and feedback loops function as motivational catalysts, converting short-term engagement into repeated exposure and deeper learning (Prasad, 2021; Yaacob et al., 2024). Narrative and cultural storytelling corrects socio-cultural misperceptions about debt and risk, particularly in collectivist and religiously conservative settings (Adam et al., 2025; Permatasari et al., 2025). Social and competitive mechanics, leaderboards, peer sharing, and collaborative tasks — activate normative change and observational learning (Hunjra et al., 2016; Zhao & Fang, 2023).

Mediating variables: Three causal pathways

Cognitive pathway. Simulations and feedback reduce information asymmetry and make abstract insurance concepts (premiums, coverage limits, claims processes) tangible. This improves comprehension and elevates perceived usefulness of insurance, which is the necessary cognitive precursor to purchase intention (Lei & Wang, 2025; Rubin et al., 2025; Zhang et al., 2024).

Motivational/affective pathway. Game features that reward mastery, provide immediate feedback, and celebrate small wins build self-efficacy, the belief that one can competently evaluate and use insurance products. This reduces perceived behavioural control barriers and elevates behavioural readiness (Aries et al., 2020; Prasad, 2021; Sari et al., 2025). The review documents consistently higher completion and persistence rates for gamified modules compared to traditional education, which is critical for durable behaviour change (Permatasari et al., 2025; Rizkiana & Khalisabira, 2023).

Social/contextual pathway. Peer mechanics normalise insurance as a prudent business practice and reduce culturally rooted mistrust. Simultaneously, gamified tools that embed digital skills and practical know-how, calculating premiums, filing claims, and navigating online purchase channels, remove operational barriers so that intention can convert to actual purchase (Nainggolan et al., 2025; Fahlevi et al., 2025).

All three pathways converge on behavioural intention before reaching the dependent variable. This intermediate node reflects the review's finding that gamification primarily affects proximal outcomes (knowledge, confidence, willingness), with uptake depending also on the moderating context.

Dependent variable: Insurance uptake among MSMEs

The outcome variable is conceived as multi-dimensional: initial purchase, renewal behaviour, operational competence in using the product, and broader contribution to financial inclusion and risk resilience. The review notes that most evidence captures intermediate outcomes; long-term field studies tracking actual renewal remain limited, which is why the feedback loop is integral to the model's sustainability claim (Setijawan et al., 2023; Agrawal, 2025).

Moderating variables

Four clusters moderate the strength of the pathways above.

Digital context (digital access and digital literacy) is identified as the primary moderator: platform familiarity, connectivity, and basic technical skills are prerequisites for meaningful engagement with gamified modules. Where these are low, the fidelity of the learning experience degrades, and all three mediating paths weaken (Aries et al., 2020; Agrawal, 2025; Saputra et al., 2021).

Institutional context (trust in insurers, regulatory clarity, and supportive public policy) moderates whether literacy gains translate into purchase. In low-trust environments, even highly effective gamified programmes fail to convert intention into uptake without credible institutional guarantees or third-party endorsements (Haamukwanza, 2021; Gupta & Jaiswal, 2025; Tereszkiewicz & Cichowicz, 2024).

Financial and MSME characteristics (income, affordability, owner age, gender, and geography) determine whether improved willingness can become an actual purchase. Gamification must be paired with appropriate product pricing or subsidy mechanisms to reach constrained MSMEs (Gupta & Jaiswal, 2025; Rubin et al., 2025; Chakraborty & Kr Das, 2019).

Socio-cultural and product moderators are consolidated into a single band to reflect the review's finding that cultural and religious norms, economic conditions, timing, and product-market fit collectively modulate all stages of the causal model. Localised narrative design and Sharia-compliant product framing are recommended interventions where these norms inhibit receptivity (Adam et al., 2025; Lestari et al., 2025; Nainggolan et al., 2025).

Sustainability feedback loop

The base of the model connects insurance uptake back to the intervention via three sustainability mechanisms: renewal behaviour evidences durable adoption; peer diffusion spreads awareness through social networks, reinforcing the social/contextual pathway; and accumulated evidence enables iterative improvement of gamification design. This loop is grounded in the review's conclusion that gamification's value lies in cultivating capabilities (financial and digital) rather than raising transient awareness, and in its call for stakeholder alignment, governments, insurers, educators, and fintech developers, to sustain the enabling infrastructure (Rizkiana & Khalisabira, 2023; Fahlevi et al., 2025).

Contribution to theory and policy

Theoretically, the framework integrates cognitive load theory (reduced asymmetry via simulation), self-determination theory (intrinsic motivation, mastery), and social influence theory (peer norms) within a single model that is grounded exclusively in the reviewed evidence. Policy-wise, the moderator clusters make clear that gamification is a necessary but insufficient condition: achieving sustainable insurance adoption requires complementary investments in digital infrastructure, institutional credibility, affordable product design, and culturally sensitive content localisation.

5 Conclusions

This systematic review explored the intersection between gamification, financial literacy, and insurance adoption among MSMEs, focusing on how game-based interventions influence knowledge, behaviour, and sustainable insurance participation. By synthesising findings across multiple empirical and conceptual studies, the review reveals that gamified financial literacy tools consistently outperform traditional financial education methods in improving engagement, comprehension, and retention of insurance-related knowledge. The dynamic, interactive nature of gamification fosters intrinsic motivation, emotional connection, and active learning, factors that traditional lecture-based or informational campaigns rarely achieve.

The evidence further shows that gamified approaches not only enhance understanding but also promote sustained behavioural change. MSMEs exposed to gamified financial learning demonstrate a greater likelihood of translating awareness into practical insurance adoption, indicating that gamification strengthens the cognitive-behavioural bridge between knowledge and real-world financial decisions.

However, the review also establishes that the success of gamified interventions is not universal; it is highly context-dependent. Key moderating factors, such as digital literacy, access to technology, financial capacity, institutional trust, cultural and religious norms, and regulatory support, collectively determine the magnitude and sustainability of gamification’s impact. In digitally advanced and culturally open contexts, gamified tools yield stronger and more sustained results. Conversely, in low-trust, low-access environments, even well-designed gamified programs face adoption barriers unless supported by enabling infrastructure, credible institutions, and affordable financial products.

Overall, this review concludes that gamified financial literacy holds significant potential as a transformative strategy for bridging the gap between financial awareness and insurance uptake among MSMEs globally. To unlock its full potential, stakeholders, governments, insurers, educators, and FinTech developers must align technological innovation with local realities. This means ensuring inclusive digital access, embedding cultural and value-based relevance, promoting institutional transparency, and integrating gamified learning with practical access to insurance services.

In sum, gamification is not a replacement but a reinforcement of traditional financial education, an adaptive tool that transforms learning into lasting behavioural outcomes. When contextualised effectively, it can drive meaningful progress toward financial inclusion, risk resilience, and sustainable economic participation among micro, small, and medium enterprises worldwide.

Implications of the Study

The findings of this systematic review carry significant theoretical, practical, and policy implications for advancing financial inclusion and sustainable insurance adoption among MSMEs through gamified financial literacy tools.

From a theoretical perspective, the study contributes to the growing body of knowledge linking gamification theory, behavioural finance, and financial literacy frameworks. It provides empirical grounding for the argument that gamification serves as a behavioural catalyst, enhancing intrinsic motivation, engagement, and retention, which are central to self-determination theory and the theory of planned behaviour. The review also deepens understanding of how interactive learning environments can reshape cognitive and emotional drivers of insurance adoption, thereby expanding the conceptual boundaries of traditional financial education research.

In terms of practical implications, the findings underscore the need for policymakers, insurers, and educators to integrate gamified tools into MSME-focused financial education programs. Gamified learning modules, when designed with context-specific features such as localised scenarios, adaptive feedback, and reward systems, can effectively overcome barriers like low engagement, poor retention, and limited financial understanding. For MSMEs, particularly in developing economies, gamified financial literacy can transform abstract insurance concepts into practical, relatable experiences, fostering long-term financial resilience. Moreover, digital delivery modes make these interventions scalable, cost-effective, and accessible even in resource-constrained environments.

From a policy standpoint, the study highlights the importance of building enabling ecosystems that support the adoption and sustainability of gamified financial literacy initiatives. Policymakers should prioritise investments in digital infrastructure, promote partnerships between financial institutions and technology providers, and establish supportive regulations that encourage innovation in financial education. Encouraging collaboration among FinTech firms, insurers, and MSME associations could lead to co-created gamified tools that align with real-world business challenges and risk management needs. Additionally, policies promoting trust, transparency, and cultural alignment can enhance acceptance and ensure that gamified literacy interventions contribute meaningfully to national financial inclusion agendas.

Finally, this review suggests that future research and practice should focus on contextual customisation, adapting gamified financial literacy models to local cultures, digital readiness levels, and socio-economic conditions. By doing so, stakeholders can ensure that gamification does not remain a superficial engagement tool but evolves into a strategic mechanism for sustainable behavioural transformation in MSME financial decision-making.

In essence, the study's implications emphasise that gamified financial literacy is both an innovation and an intervention, a powerful means to democratise insurance education, foster resilience, and advance the broader goal of inclusive, sustainable economic growth.

Study Limitations

Several limitations warrant consideration in interpreting the findings of this systematic review. First, the review is restricted to articles published in the English language. While this decision was deliberately made to ensure a unified body of literature and to avoid potential bias in interpretation and translation, it may have inadvertently excluded relevant studies published in other languages.

Second, the heterogeneity of intervention designs, outcome measures, and sample populations across the reviewed studies limits the comparability of findings. Gamified financial literacy tools vary considerably in their complexity, delivery mode, duration, and cultural embeddedness, making it difficult to isolate which specific gamification elements are most effective or to estimate standardised effect sizes.

Additionally, Publication bias may have influenced the composition of the review. Studies reporting positive or statistically significant outcomes for gamified interventions are more likely to have been published, which may overrepresent the effectiveness of such tools while underreporting null or negative findings.

Finally, while the review synthesises evidence from a range of geographic and economic contexts, the generalisability of findings remains bounded by contextual factors such as digital infrastructure, regulatory environments, cultural norms, and financial capacity. The variability in these enabling conditions means that conclusions drawn from one setting may not transfer directly to another, and stakeholders should exercise caution in adapting these findings to their specific local contexts without appropriate contextualisation.

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Declaration of Use of Generative AI

In accordance with the publication ethics policy of Elicit Publishing Limited, the author(s) state that generative artificial intelligence (AI) tools were used only to improve language clarity and formatting. These tools were not involved in the study's conception, research design, data collection, analysis, or interpretation. The author(s) take full responsibility for the accuracy, originality, and integrity of the manuscript.

Conflict of Interest

The authors declare that there are no conflicts of interest.

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